CIRC
Climate Impacts Research Consortium

Climate Impacts Research Consortium (CIRC): Public Health and Climate Change

Josh Foster (OSU/OCCRI) for
Jeff Bethel (OSU), Meghan Dalton (OSU/OCCRI), and Brian Cooke (Benton County Public Health)

RISA Annual Meeting

Charleston, SC

January 15, 2015

Regional Health Effects of Climate Change: 2013 Northwest Climate Assessment (NW NCA)

ANALYSIS OF HOSPITALIZATION AND CLIMATE DATA:

TEMPERATURE: each **10°F increase in daily max temp:**

- **3-fold increase** in **incidence of Heat Related Illness (HRI)**

AIR QUALITY: **Wildfires**, especially **east of the Cascade Mountains**:

- Periods of **poor air quality** leading to **respiratory disease**

WATER TEMPERATURE INCREASE: **Puget Sound, WA**

- promotes longer **harmful algal blooms**
- causing **paralytic shellfish poisoning from infected shellfish**

DISEASE: **Longer, drier, and warmer summers :**

- **impacts on incidence of *arboviruses (encephalitis)***

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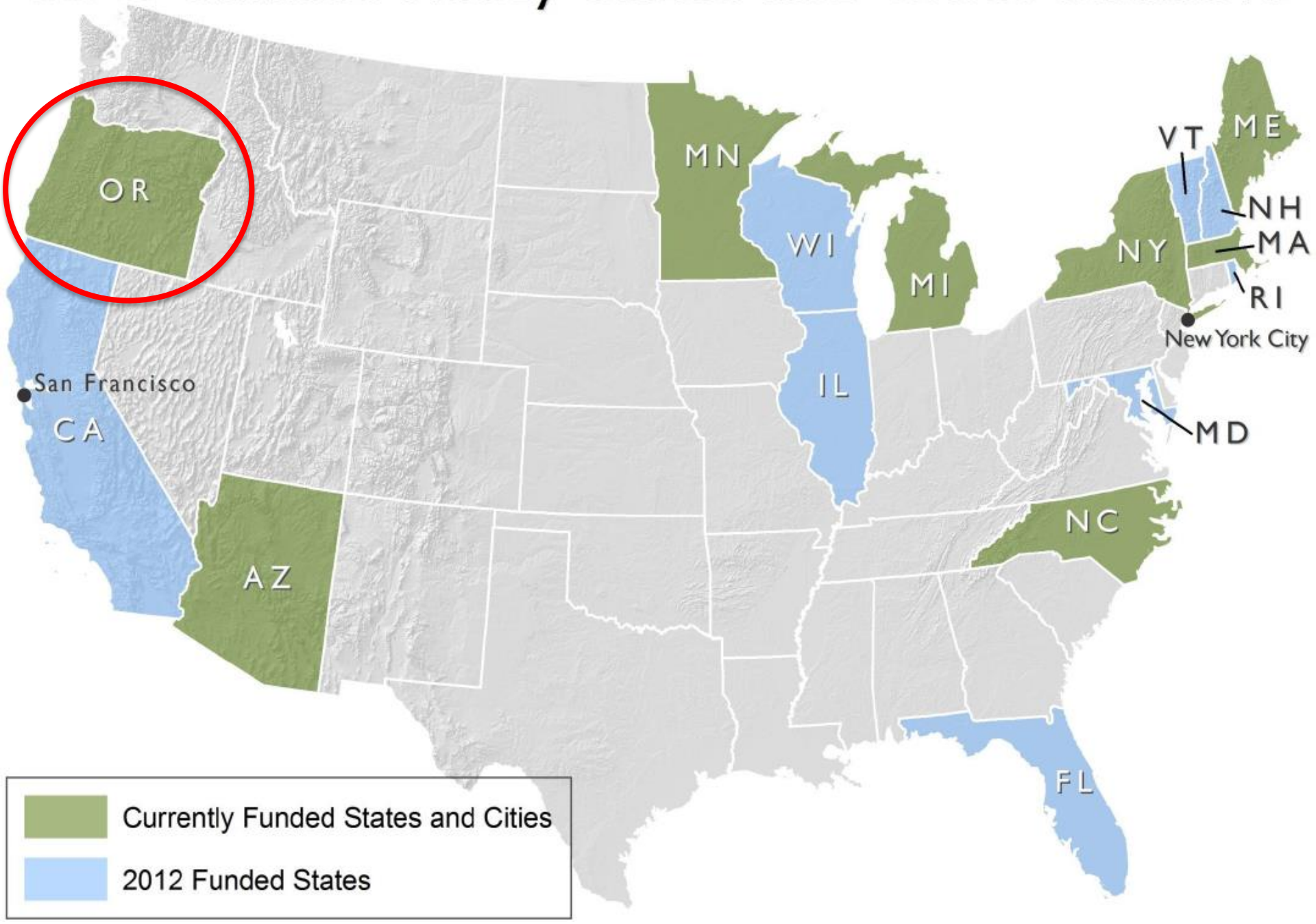
CDC Climate Ready States and Cities Initiative



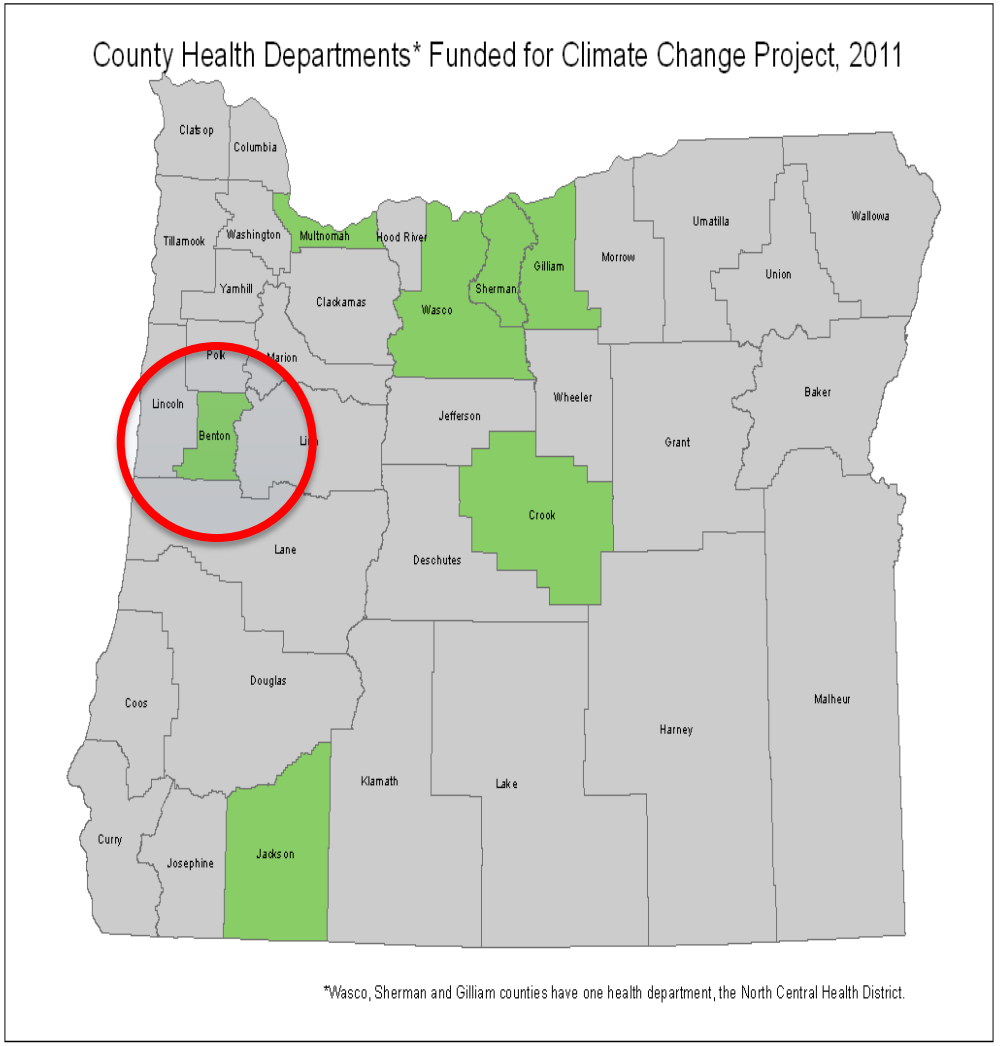
Building Resilience to Climate Effects (BRACE) - Oregon County Partners

Oregon Health Authority

5 County Areas (Benton, Crook, Jackson, Multnomah, and North Central Health District)

Benton County Partners:

- **Benton Public Health**
- **Emergency Management**
- **Community Development**
- **fire/health care/hospitals**
- **OCCRI - CIRC**



Benton County Health Department

BRACE Grant: 2 years - $35,000:

Brian Cooke: Public Health Emergency Planner (PHEP)

- **disaster planning role**
- **convening and coordinating partners**

Benton County Health
Learning Objectives – RISA Engagement

- Collecting Information on Climate Change **(e.g. NW NCA, OCCRI)**
- Working with Local Partners to plan for Climate Change **(e.g. CIRC)**
- Developing Climate Change Health Risk Assessment Model **(Benton County & CIRC)**
- Leading to Benton County Climate Health Adaptation Plan **(YAY!!!!)**

Benton County – Climate Change Health Risk Assessment Model

- Based on Oregon Health Authority

  - Public Health Emergency Preparedness and Planning efforts

- Health Vulnerability Analysis Tool
- Consistent with emergency preparedness and planning

Benton County
Climate Change Health Risk Model

Enterprise-wide

CLIMATE CHANGE HEALTH RISK ASSESSMENT MODEL

Revised: December 2012

Climate Risks

Health Risks

Risk Level

Climate Risk	Probability of Occurrence	Worksheet Public Health Climate Change Consequences — Potential Health Risk: Fatalities	Chronic Disease	Communicable Disease	Respiratory Disease	Waterborne/Foodborne Diarrheal Disease	Vectorborne Disease	Vulnerable Populations	Food Access/Equality	Air Quality	Public Health Consequence — Overall Impact (Average) (1= Lowest 3 = Highest)	Public Health Risk — Probability x Overall Impact (Average) (1= Lowest 30 = Highest)
Drought & Reduced Summer Water Supply											#DIV/0!	#DIV/0!
Extreme Heat Event											#DIV/0!	#DIV/0!
Wildfire											#DIV/0!	#DIV/0!
Extreme Precipitation & Flooding											#DIV/0!	#DIV/0!
Ozone Pollution											#DIV/0!	#DIV/0!
Longer Growing Season											#DIV/0!	#DIV/0!
											#DIV/0!	#DIV/0!
											#DIV/0!	#DIV/0!
											#DIV/0!	#DIV/0!
											#DIV/0!	#DIV/0!

Climate Risks	Included Within Climate Risk Categories
Drought & Reduced Summer Water Supply	Decrease in Summer flow
Extreme Precipitation & Flooding	Winter Storm, Winter Flooding, & Increased Stream Flow
Longer Growing Season	Vegetation & decrease in frost

Some of these were combined together because of the similar climate drivers.

Potential Health Risk Scale
Low Health Impact = 1
Medium Health Impact = 2
High Health Impact = 3

- 1=Low
- 2=Medium
- 3=High

Created By
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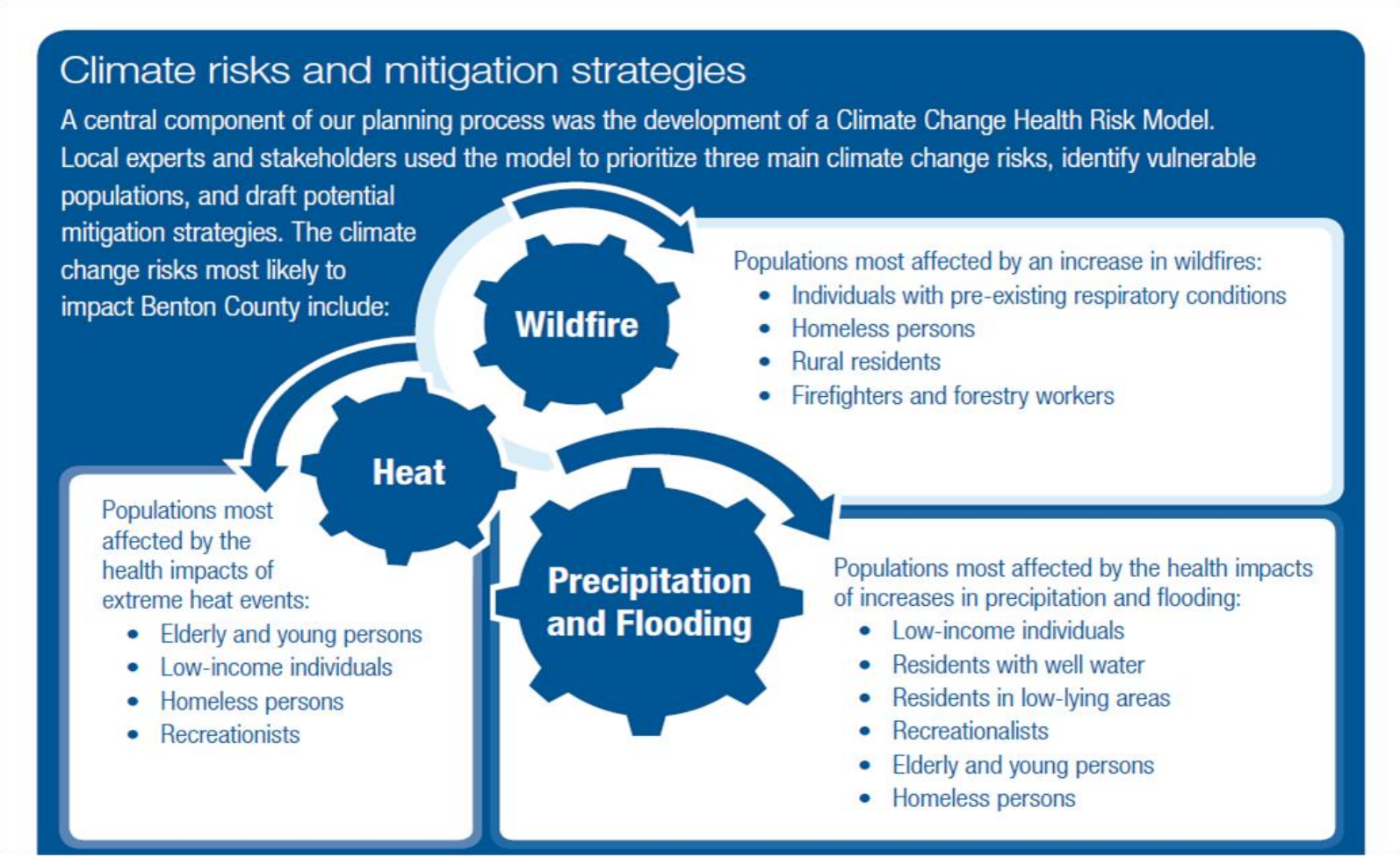
Meghan Dalton Oregon Climate Change Res. Inst./College of Earth Ocean and Atmo. Sci. 541-737-3081

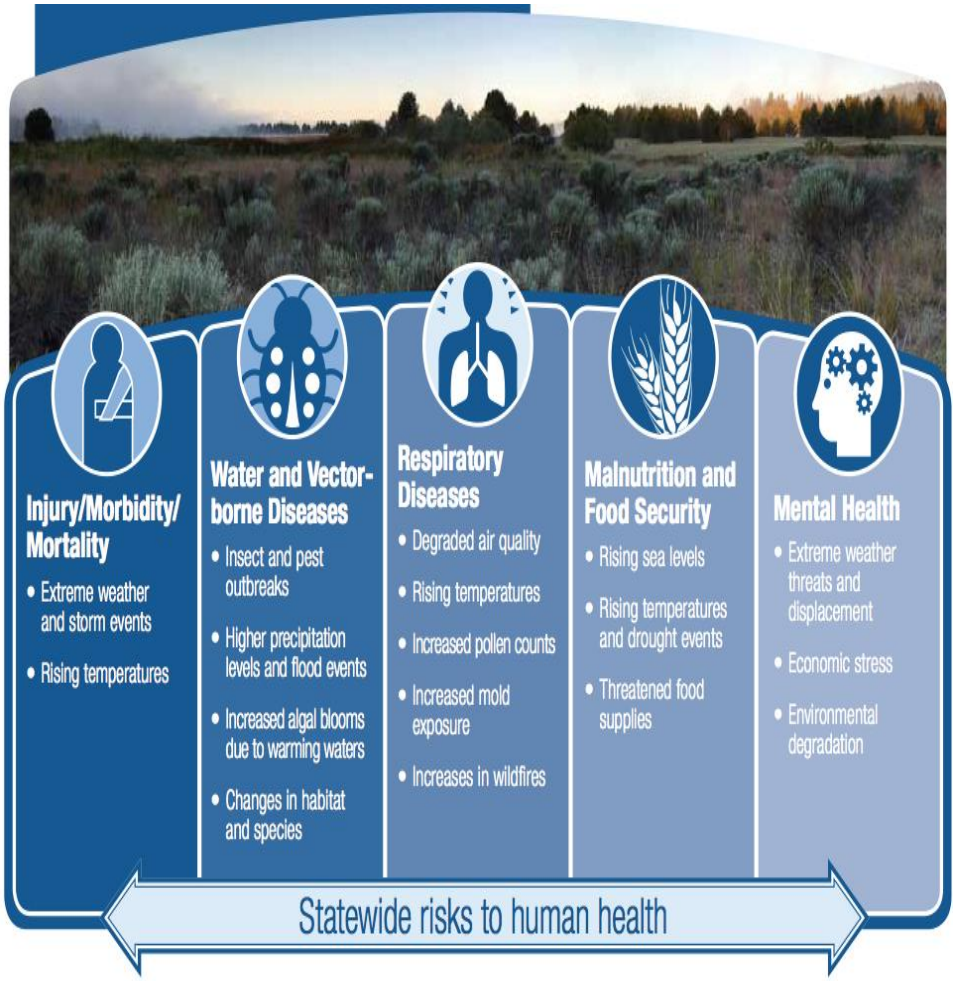
Expert Judgment → **Impacts**

Benton County - Climate Risks



Benton County - Health Risks

- Weather Fatalities
- Chronic Diseases
- Communicable Diseases
- Respiratory Diseases
- Waterborne/Foodborne
- Diarrheal Disease
- Vectorborne Disease
- Food Access/Quality
- Air Quality
- Vulnerable Populations – e.g homeless, low income, young, elderly



Health Risk Model - Policy Impact

- Drove creation of Benton County Climate Health Adaptation Plan, including:
  <http://public.health.oregon.gov/HealthyEnvironments/climatechange/Documents/AdaptationPlans/summary-sheet-benton.pdf>
  <http://public.health.oregon.gov/HealthyEnvironments/climatechange/Documents/AdaptationPlans/adaptation-plan-benton.pdf>
- Structuring of health adaptation plan
- Shaping future county health resource planning
- Transferable: will help other Benton County agencies include climate change in planning
  - CDC: Model for counties nationwide
- Local Policy: County Commission adaptation planning support

CIRC 2.0 Proposal and Beyond - Climate – Health: Going Coastal

Continue working through BRACE Framework with:

- Grays Harbor County Health Department in southwest coastal Washington state
- Tribal nation on Puget Sound in Washington state (May 2015 submission to NIEHS)
  - Incorporate non-physiological or tribal cultural definitions of "health"

Partner with Oregon Health Authority

- to identify past and future burden of occupational and non-occupational heat-related illness and death

Climate Change - Health Knowledge Gaps and Research Needs

- Continued **accurate surveillance** data on climate-sensitive health outcomes
- Integrating **environmental monitoring** with public **health monitoring**
- Increased **regional-level modeling**
- Increase **capacity building** efforts across state health departments and local health jurisdictions
- Improved understanding of the **interaction between climate and vector-borne and zoonotic diseases** (VBZD) and better understanding of how climate change will affect the epidemiology of VBZDs

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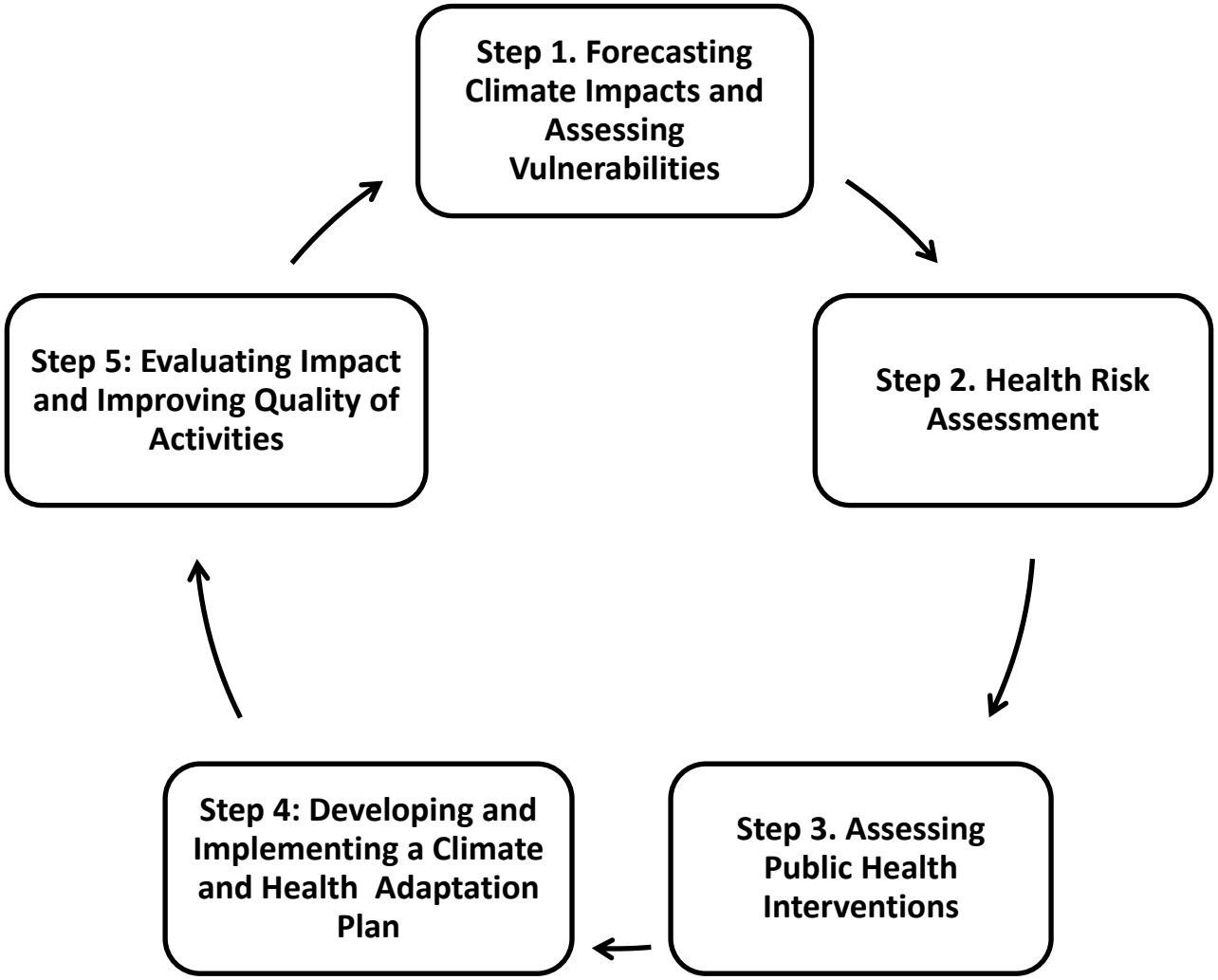
Extra Slides

BRACE Framework

- 5 step process that all counties went through to test the Building Resilience Against Climate Effects (BRACE) framework
- 5 steps included:
  - Forecasted Impact & Vulnerability Assessment
  - Health Risk Assessment
  - Intervention Assessment
  - Health Adaptation Planning & Implementation
  - Evaluation of the BRACE framework

Building Resilience Against Climate Effects (BRACE)



Goal for the Counties

- Test the BRACE Framework to see what works and what could be improved upon
- Create tools for others to use to help in creating their own Health Adaptation Plan
- Educate local partners about the need for considering health impacts planning in planning for climate change

Lessons Learned From The 5 Counties

- Identifying Stakeholders early on
- Identify who is already doing Climate Change
- Be strategic about when and how to approach leaders and elected officials.
- Difficult to breakdown the “silos”.
- Limited Resources
- How to integrate climate change and Emergency Management

CDC National Center For Environmental Health

- Climate-Ready States and Cities Initiatives:
  - September 2011- August 31, 2013
  - $35, 000 for two years
  - First year (9/1/2011-8/31/2012) allowed for 3.5 hours per week to work on project
  - Second year (9/1/2012-8/31/2013) allowed for 1.5 hours per week to work on project

Benton County Process

CDC National Center for Environmental Health

Oregon Health Authority

Counties (Benton, Crook, Jackson, Multnomah, and North Central Health District)

Local Community Partners (Emergency Management, Oregon Climate Change Research Institute (OCCRI), and other local partners.

Model Created

- Helps to drive the creation of the Climate Health Adaptation Plan
  - Structuring of plan
  - Resource planning for future needs
  - Model can be used to help other agencies include climate change within their plans

- Model is based off of the Health Vulnerable Analysis tool built by the Oregon Health Authority Public Health Emergency Preparedness Planner section. This helps to keep this model in line with emergency preparedness.

Planning Partners

- Partners include Environmental Health, Public Health, Oregon Climate Change Research Institute, Emergency Management, Community Development, Oregon Public Health Authority, Good Samaritan Regional Medical Center, and Internal Quality Health Care.

Benton County Health Adaptation Plan

- Model helped identify major areas to plan for:
  - Extreme Heat Events
  - Extreme Precipitation and Flooding
  - Wildfire
- With these areas identified it helped in creating a Benton County Health Adaptation plan focused on the identified areas.

Conclusion

- Climate Change is something that needs to be planned for starting now
- Climate Change will affect the local level
- Climate Change will effect Counties Differently
- Planning for Climate Change should be across the different agencies in the County (Emergency Management, Fire Departments, Health Departments, Community Builders, etc.)
- PHEP coordinator can be a big asset in bringing local partners together.

First Model

Enterprise-wide			Worksheet Public Health Climate Change Consequences																
CLIMATE CHANGE HEALTH RISK ASSESSMENT MODEL			HEALTH AND SAFETY								RESPONSE CAPACITY-HOSPITAL	PROVIDERS			PUBLIC HEALTH INFRASTRUCTURE			Public Health Consequence	Public Health Risk
			Potential Health Risk								Ability to Support Increased Climate Risk Diseases	Surge Capacity			Surge Capacity			Overall Impact (Average)	Probability x Overall Impact (Average)
Revised: May 2012																			
Climate Risk		Probability of Occurrence	Fatalities	Respiratory Illness	Chronic Disease	Communicable Diseases	Vulnerable Populations	Food Access/Quality	Water Access/Quality	Air Quality	Infection Control	Providers	Mental Health	Nurses	Environmental Health Staff	Communicable Disease Nurses	Immunizations	1= Lowest 5 = Highest	1= Lowest 50 = Highest
	Drought & Reduced Summer Water Supply	3	1	2	1	2	2	1	3	1	1	1	1	2	2	2	2	1.60	4.80
	Extreme Heat Event	10	1	2	1	2	2	1	3	1	1	1	1	2	2	2	2	1.60	16.00
	Wildfire	5																#DIV/0!	#DIV/0!
	Extreme Precipitation & Flooding	8	2	3	3	2	4	4	3	1	3	2	3	3	4	3	2	2.80	22.40
	Ozone Pollution	6																#DIV/0!	#DIV/0!
	Longer Growing Season	5																#DIV/0!	#DIV/0!
																		#DIV/0!	#DIV/0!
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First Model Results

- Very complicated to explain.
- Did not look at health consequences only.
- Very confusing to local partners, and county partners.

New Model Design

Enterprise-wide			Worksheet Public Health Climate Change Consequences									Public Health Consequence	Public Health Risk
CLIMATE CHANGE HEALTH RISK ASSESSMENT MODEL			HEALTH AND SAFETY										
Revised: May 2012			Potential Health Risk									Overall Impact (Average)	Probability x Overall Impact (Average)
Climate Change Risk		Probability of Occurrence	Fatalities	Chronic Disease	Communicable Disease	Respiratory Disease	Waterborne/Foodborne Diarrheal Disease	Vectorborne Disease	Vulnerable Populations	Food Access/Quality	Air Quality	1= Lowest 5 = Highest	1= Lowest 50 = Highest
	Drought & Reduced Summer Water Supply	4										#DIV/0!	#DIV/0!
sub-category	Decrease in Summer Flow											#DIV/0!	#DIV/0!
	Extreme Heat Event	9										#DIV/0!	#DIV/0!
	Wildfire	5										#DIV/0!	#DIV/0!
	Extreme Precipitation & Flooding	8										#DIV/0!	#DIV/0!
sub-category	Winter Storm											#DIV/0!	#DIV/0!
	Winter Flooding											#DIV/0!	#DIV/0!
	Increased Stream Flow											#DIV/0!	#DIV/0!
	Ozone Pollution	6										#DIV/0!	#DIV/0!
	Longer Growing Season	5										#DIV/0!	#DIV/0!
sub-category	Vegetation											#DIV/0!	#DIV/0!
	Decrease in Frost											#DIV/0!	#DIV/0!
												#DIV/0!	#DIV/0!
												#DIV/0!	#DIV/0!
												#DIV/0!	#DIV/0!
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Improvements

- Looks at health issues only.
- Analysis is answered in the planning part (surge capacity, equipment, etc.).
- Easier to explain to others.

Benton County Model

Enterprise-wide			Worksheet Public Health Climate Change Consequences									Public Health Consequence	Public Health Risk
CLIMATE CHANGE HEALTH RISK ASSESSMENT MODEL			HEALTH AND SAFETY										
Revised: May 2012			Potential Health Risk									Overall Impact (Average)	Probability x Overall Impact (Average)
Climate Risk		Probability of Occurrence	Fatalities	Chronic Disease	Communicable Disease	Respiratory Disease	Waterborne/Foodborne Diarrheal Disease	Vectorborne Disease	Vulnerable Populations	Food Access/Quality	Air Quality	1= Lowest 5 = Highest	1= Lowest 50 = Highest
	Drought & Reduced Summer Water Supply	4	0	1	1	2	2	2	1	1	2	1.33	5.33
sub-category	Decrease in Summer Flow											#DIV/0!	#DIV/0!
	Extreme Heat Event	9	2	2	1	2	2	1	3	3	3	2.11	19.00
	Wildfire	8	1	1	1	2	1	1	2	1	3	1.44	11.56
	Extreme Precipitation & Flooding	8	1	1	2	2	3	2	2	2	1	1.78	14.22
sub-category	Winter Storm											#DIV/0!	#DIV/0!
	Winter Flooding											#DIV/0!	#DIV/0!
	Increased Stream Flow											#DIV/0!	#DIV/0!
	Ozone Pollution	6	0	2	0	2	0	1	1	1	3	1.11	6.67
	Longer Growing Season	5	0	1	1	3	1	2	0	0	1	1.00	5.00
sub-category	Vegetation											#DIV/0!	#DIV/0!
	Decrease in Frost											#DIV/0!	#DIV/0!
												#DIV/0!	#DIV/0!
												#DIV/0!	#DIV/0!
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Results

- Local Partners found it easier to use.
- Outcome of the model shows that the Climate Health Adaptation Plan should focus on Extreme Heat Events, Extreme Precipitation and Flooding, and Wildfire.